

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

1-29. (Canceled)

30. (Currently amended) ~~The platform of claim 26,~~ A platform for use in sample analysis, said platform having one or more sensing areas or regions, each for receiving a capture element or elements which when the platform is irradiated with coherent light can interact to provide an indication of an affinity reaction, wherein each capture element includes two or more types of capture molecule, the platform further comprising an optically transparent substrate having a refractive index (n1), a thin, optically transparent layer, formed on one surface of the substrate, said layer having a refractive index (n2) which is greater than (n1), said platform incorporating therein one or multiple corrugated structures comprising periodic grooves which define the one or multiple sensing areas or regions, said grooves being so profiled, dimensioned and oriented that coherent light incident on said platform is diffracted into individual beams or diffraction orders which interfere resulting in reduction of the transmitted beam and an abnormal ~~anormal~~ high reflection of the incident light thereby generating an enhanced evanescent field at a surface of the one or more sensing areas.

31. (Previously Presented) The platform of claim 30, wherein the enhanced evanescent field interacts with luminescent material on or in the vicinity of one of the sensing areas or regions so as to produce a detectable luminescent signal.

32. (Currently amended) ~~The platform of claim 26,~~ A platform for use in sample analysis, said platform having one or more sensing areas or regions, each for receiving a capture element or elements which when the platform is irradiated with coherent light can interact to provide an indication of an affinity reaction, wherein each capture element includes two or more types of capture molecule, the platform further comprising an optically transparent

6 substrate having a refractive index ( $n_1$ ), a thin, optically transparent layer, formed on one surface  
7 of the substrate, said layer having a refractive index ( $n_2$ ) which is greater than ( $n_1$ ), said platform  
8 incorporating therein one or multiple corrugated structures comprising periodic grooves which  
9 define the one or multiple sensing areas or regions, said grooves being so profiled, dimensioned  
10 and oriented that coherent and linearly polarised light incident on said platform is diffracted into  
11 individual beams or diffraction orders which interfere resulting in a substantially total extinction  
12 of the transmitted beam and an abnormal ~~anormal~~ high reflection of the incident light thereby  
13 generating an enhanced evanescent field at a surface of the one or more sensing areas.

1 33. (Previously Presented) The platform of claim 32, wherein the enhanced  
2 evanescent field interacts with luminescent material on or in the vicinity of one of the sensing  
3 areas or regions so as to produce a detectable luminescent signal.

1 34. (Previously Presented) The platform of claims 31 or 33, wherein the  
2 luminescent material comprises a fluorophore, and wherein the luminescent signal comprises a  
3 fluorescent signal.

1 35. (Previously Presented) The platform of claims 30 or 32, wherein the  
2 center-to-center spacing between each of the one or more sensing areas or regions is between  
3 about 1  $\mu\text{m}$  and about 1 mm.

1 36. (Previously Presented) The platform of claims 30 or 32, wherein said  
2 light incident on the platform is incident on the side of the substrate having the optically  
3 transparent layer formed thereon.

1 37 - 39. (Canceled)

1 40. (Previously Presented) The platform of claim 30 or 32, wherein the  
2 grooves of at least one of said corrugated structures are profiled, dimensioned and oriented such  
3 that the radiation loss coefficient of the incident light within the at least one corrugated structure  
4 is on the order of 2000/cm or greater.

1                   41.     (Previously Presented) The platform of claim 30 or 32, wherein the  
2     grooves of at least one of said corrugated structures are profiled, dimensioned and oriented such  
3     that the propagation distance of the incident light within the at least one corrugated structure is  
4     less than about 100  $\mu\text{m}$ .

1                   42.     (Previously Presented) The platform of claim 30 or 32, wherein the  
2     grooves of at least one of said corrugated structures are profiled, dimensioned and oriented such  
3     that the propagation distance of the incident light within the at least one corrugated structure is  
4     less than about 10  $\mu\text{m}$ .

1                   43.     (Previously Presented) The platform of claim 30 or 32, wherein the depth  
2     of the grooves is in the range of about 50 nm to the thickness of the optically transparent layer.

1                   44.     (Previously Presented) The platform of claim 30 or 32, wherein  
2                             the depth of the grooves is in the range of about 30 nm to the thickness of  
3     the optically transparent layer,  
4                             the thickness of the optically transparent layer is in the range of 30 to 1000  
5     nm,  
6                             the period of the corrugated structure is in the range of 200 to 1000 nm,  
7                             the ratio of groove depth to the thickness of the optically transparent layer  
8     is in the range of 0.02 to 1, and  
9                             the ratio of groove width to the period of the grooves is in the range of 0.2  
10    to 0.8.

1                   45.     (Canceled).

1                   46.     (Previously Presented) Apparatus for analyzing samples comprising a  
2     platform according to claims 30 or 32, and further including means for generating a light beam  
3     and for directing the beam so that it is incident upon the platform on the side of the substrate  
4     having the optically transparent layer disposed thereon at an angle which causes evanescent

5 resonance to occur in at least one sensing area of the platform to thereby create an enhanced  
6 resonant field in the at least one sensing area of the platform, and means for detecting a  
7 characteristic of an affinity reaction occurring on or in the vicinity of, or a characteristic of a  
8 material disposed on or in the vicinity of, the at least one sensing area of the platform.

1 47. (Canceled).

1 48. (Currently amended) ~~The platform of claim 26,~~ A platform for use in  
2 sample analysis, said platform having one or more sensing areas or regions, each for receiving a  
3 capture element or elements which when the platform is irradiated with coherent light can  
4 interact to provide an indication of an affinity reaction, wherein each capture element includes  
5 two or more types of capture molecule, wherein each type of capture molecule includes a  
6 molecule selected from the group consisting of a nucleotide, an oligonucleotide, DNA, RNA,  
7 PNA, an antibody, an antigen, a protein, an antibiotic, a drug, an enzyme, a ligand, a peptide, a  
8 polymer, a molecular probe, a receptor, an indicator and a tissue sample.